

What is claimed is:

1. A method of processing a digital audio signal, comprising the steps of:
 - providing a digital audio signal having a defined frequency spectrum;
 - providing and operating a user interface to select a fundamental frequency from the frequency spectrum;
 - providing a harmonics generation function to generate a number of signal harmonics based on the fundamental frequency; and
 - adding the signal harmonics to the digital audio signal at the fundamental frequency.
2. The method of claim 1, wherein the step of providing a digital audio signal further comprises the steps of:
 - providing an analog audio signal;
 - providing an analog to digital conversion function; and
 - converting the analog audio signal into the digital audio signal using the analog to digital conversion function.
3. The method of claim 1, wherein the step of providing and operating a user interface further comprises providing a user input mechanism and a user feedback mechanism.
4. The method of claim 3, wherein the step of providing and operating a user interface further comprises providing an auditory user feedback mechanism.

1 5. The method of claim 3, wherein the step of providing and operating a user interface
2 further comprises providing a visual user feedback mechanism.

1 6. The method of claim 3, wherein the step of providing and operating a user interface
2 further comprises providing both visual and auditory user feedback mechanisms.

1 7. The method of claim 3, wherein the step of providing and operating a user interface
2 further comprises providing a mechanical user input mechanism.

1 8. The method of claim 3, wherein the step of providing and operating a user interface
2 further comprises providing an electro-mechanical user input mechanism.

1 9. The method of claim 3, wherein the step of providing and operating a user interface
2 further comprises providing an electronic user input mechanism.

1 10. The method of claim 3, wherein the step of providing and operating a user interface
2 further comprises providing a signal modification window.

1 11. The method of claim 10, wherein the step of providing and operating a user interface
2 further comprises providing a user the ability, via the user input mechanism, to move the
3 signal modification window through the frequency spectrum to a desired fundamental
4 frequency position.

1 12. The method of claim 11, further comprising the step of providing a memory function.

1 13. The method of claim 12, further comprising the step of storing, within the memory
2 function, information on the modification window's relative position.

1 14. The method of claim 13, further comprising the step of storing, within the memory
2 function, information correlating the information on the modification window's relative
3 position to a particular type of digital audio signal.

1 15. The method of claim 12, wherein the step of providing and operating a user interface
2 further comprises providing a plurality of signal modification windows, and wherein
3 information on each modification window's relative position is stored within the memory
4 function.

1 16. The method of claim 1, wherein the step of providing a harmonics generation
2 function further comprises providing a desired harmonics profile.

1 17. The method of claim 16, wherein the step of providing a harmonics generation
2 function further comprises providing an algorithm that generates signal harmonics, according
3 to the desired harmonics profile, of the digital audio signal at the fundamental frequency.

1 18. The method of claim 16, wherein the step of providing a harmonics generation
2 function further comprises providing a desired harmonics profile, wherein the harmonics
3 profile comprises harmonics that decrease in relative weight as relative order increases.

1 19. The method of claim 18, wherein the step of providing a desired harmonics profile
2 further comprises providing only even order harmonics.

1 20. The method of claim 19, wherein the wherein the harmonics profile comprises only
2 second, fourth and sixth harmonics.

1 21. The method of claim 18, wherein the step of providing a desired harmonics profile
2 further comprises step of providing a user, via the user interface, the ability to selectively
3 alter which harmonics are included in the harmonics profile.

1 22. The method of claim 18, wherein the step of providing a desired harmonics profile
2 further comprises step of providing a user, via the user interface, the ability to selectively
3 alter the relative weight of each harmonic included in the harmonics profile.

1 23. A device for processing digital signals comprising:
2 a signal acquisition function adapted to output a digital input signal;
3 a user interface function, communicatively coupled to a user interface, adapted to
4 receive the digital input digital audio signal and to provide a user-selected fundamental
5 frequency;
6 a comparator function, adapted to receive the digital input digital audio signal and the
7 user-selected fundamental frequency, and to output a portion of the digital input signal at the
8 user-selected fundamental frequency;
9 a harmonics generation function, adapted to receive from the comparator function the
10 portion of the digital input signal at the user-selected fundamental frequency, and to generate
11 a number of signal harmonics for the portion of the digital input signal at the user-selected
12 fundamental frequency based on a defined harmonics profile; and
13 a summing function, adapted to receive the signal harmonics from the harmonics

14 generation function and to add the signal harmonics to the digital input signal at the user-
15 selected fundamental frequency.

1 24. The device of claim 23, wherein each of the functions is implemented in a separate
2 device.

1 25. The device of claim 23, wherein two or more of the functions are integrated within a
2 single device.

1 26. The device of claim 23, wherein the signal acquisition function comprises an analog
2 to digital conversion function.

1 27. The device of claim 23, wherein the user interface function and the user interface are
2 cooperatively adapted to provide a signal modification window, by which an end-user selects
3 a fundamental frequency.

1 28. The device of claim 27, wherein the user interface comprises a user input mechanism
2 and a user feedback mechanism.

1 29. The device of claim 28, wherein the user feedback mechanism comprises an auditory
2 user feedback mechanism.

1 30. The device of claim 28, wherein the user feedback mechanism comprises a visual
2 user feedback mechanism.

1 31. The device of claim 28, wherein the user feedback mechanism comprises both visual
2 and auditory user feedback mechanisms.

1 32. The device of claim 28, wherein the user interface further comprises a mechanical
2 user input mechanism.

1 33. The device of claim 28, wherein the user interface further comprises an electro-
2 mechanical user input mechanism.

1 34. The device of claim 28, wherein the user interface further comprises an electronic
2 user input mechanism.

1 35. The device of claim 23, wherein the user interface and harmonics generation
2 functions are further adapted to generate and process, respectively, a user-adapted harmonics
3 profile.

1 36. A system for providing user-modified processing of a digital audio signal, the system
2 comprising:

3 a digital input audio signal having a defined signal spectrum;

4 a harmonics profile, adapted to specify generation of a second harmonic of weight
5 equal to 75% of the digital input audio signal, a fourth harmonic of weight equal to 50% of
6 the digital input audio signal, and a sixth harmonic of weight equal to 25% of the digital
7 input audio signal;

8 a harmonics generation function, adapted to generate the harmonics specified in the
9 harmonics profile from the digital input audio signal at a user-selected fundamental
10 frequency;

11 a summing function, adapted to add the harmonics generated by the harmonics
12 generation function to the digital input audio signal at the user-selected fundamental

13 frequency to generate a modified output audio signal;

14 a user feedback mechanism adapted to communicate the modified output audio signal

15 to a user; and

16 a user interface, adapted to provide the user the ability to move the user-selected

17 fundamental frequency throughout the signal spectrum of the digital input audio signal.